SBCCOM Geospatial Initiatives

RestOps / TBMCS-UL
(The ROIM)

GeoBase
CASPOD

SBCCOM
Fall 2002

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Report Documentation Page

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Prescribed by ANSI Std Z39-18

RestOps & TBMCS-UL

The ROIM

RestOps:
Geospatial Information Systems Supporting Base Recovery After Attack

Joint Service GeoBase CIP Utilization

Wing Situation Awareness

➢NBC

➢Decision Systems

➢Response and Recovery Operations

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TBMCS-UL:
Theater Battle Management Core System - Unit Level

Joint Service GeoBase CIP Utilization
Theater Situation Awareness

➢ Decision Systems

➢ Battle Management

➢ Air Operations

Operational Perspectives

Scoped Operations Through

➢ Joint Service Cooperation

➢ Multiple Stakeholders

➢ Decision System Integration

➢ Engineering/Requirements Share

➢ Technology/Requirements Migration

Stakeholders

- DTRA (RestOps)
- SBCCOM (RestOps)
- AFRL (Rome Labs)
- TBMCS-UL PACAF/AFC2ISRC/ESC

- ACTD
  - Advanced Concept Technology Demonstration
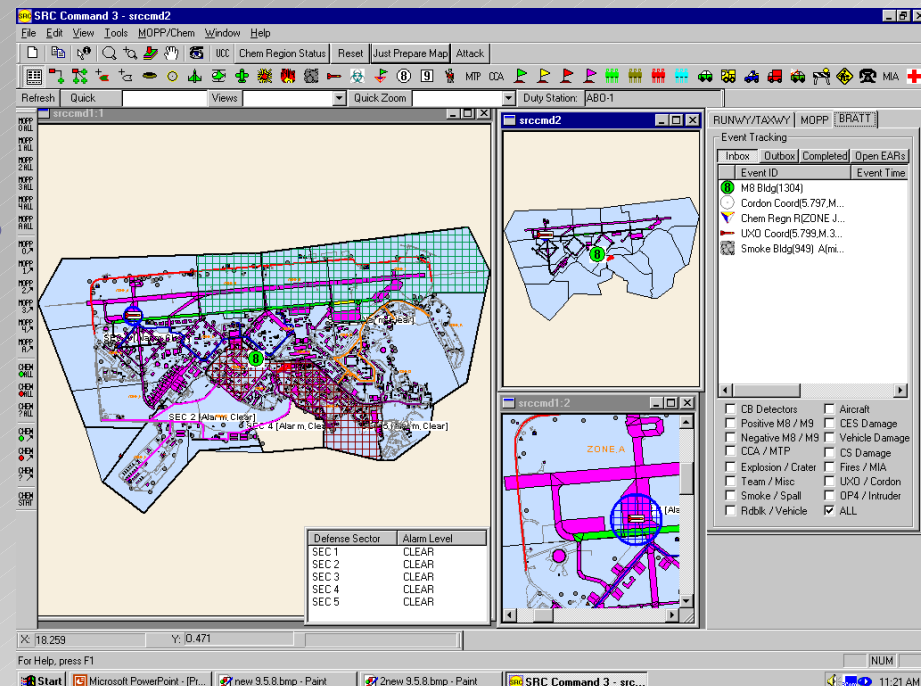- TBMCS-UL Spiral schedules

GeoBase:
  - HAF GIO
  - MAJCOM GIO(s)
  - FOA GIO

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RestOps / TBMCS-UL SRC

- SRC 'Map Tool'
  - Map Objects 2.1/C++/Oracle 9i/Shapefiles
  - Geospatial Situation Awareness Decision System
    - *Not a GIS*

- Integration with TBMCS-UL Spirals
  - Technology and Distribution
  - Oracle 9i AODB RDBMS migration

1. Situation Awareness
2. NBC Operations
3. Recovery/Response
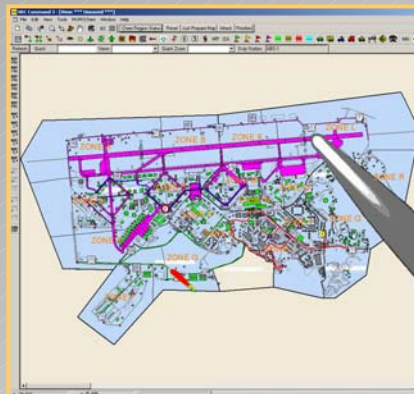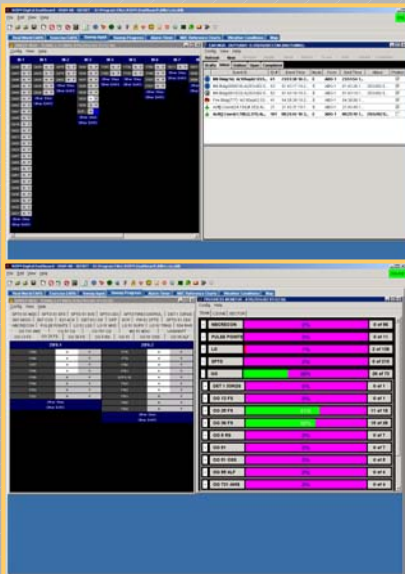4. Event Management
5. Force Protection

RestOps IT Decision Systems

ROIM (RestOps Information Management) System

•Integrated, multi-system SA decision tool

•SRC Map Tool: the Geospatial viewer

•Digital Dashboard: post attack, response and recovery ops

•NBC RPM Tool: sensor integration, hazard prediction, messaging tool

Operational Scope

Common Operating Picture
- Automated Sweep Tool to input recon results
- Networked CB sensors providing real-time inputs
- Integrated NBC modeling and messaging
- Integrated command and control directives

Situational Awareness
- Enhanced sweep progress monitor showing team status and results
- Automated hazard and event visualization
- Seamless downwind hazard display
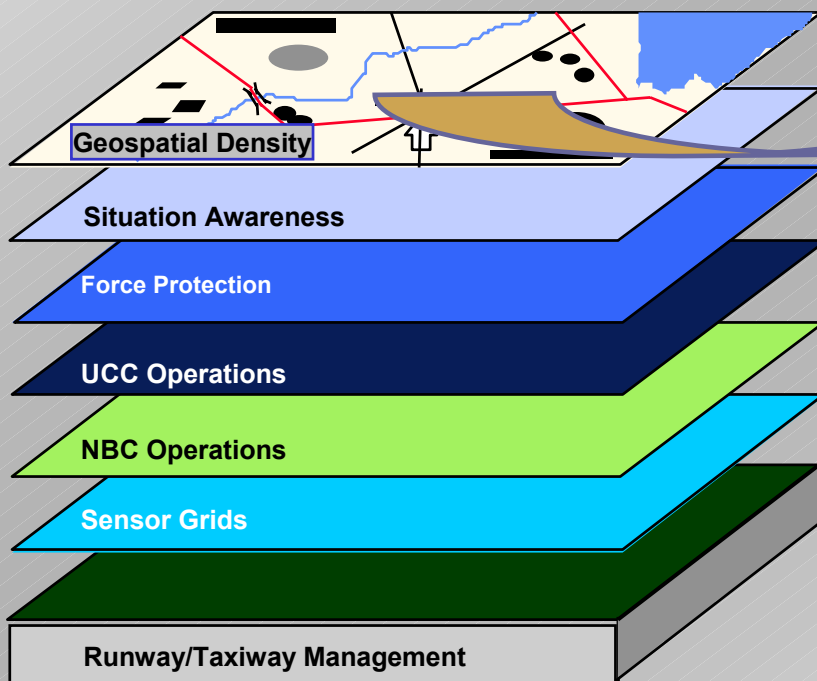- Real-time weather feeds
- Advanced Data Wall display

Event Management
- Tools to set attacks & parameters (MOPP levels) and parse incoming data
- Electronic event reporting and tracking for the duration of the event
- User defined interface allowing for tailored views of the data
- After action tools

RestOps Scope

Wing NBC/Operational

Location - Extent - Attribution

**Geospatial Processing
Symbolization
Tracking
Thematic Display**

Geospatial Density

Situation Awareness

Force Protection

UCC Operations

NBC Operations

Sensor Grids

Runway/Taxiway Management

Dense Thematic Layering

Expansive and Specific Attribution

NBC Data Format/Flow

Heavy Facilities Functionality

Situation Awareness High

Force Protection

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RestOps & TBMCS-UL Operational Environments

TBMCS-UL

i. SIPRNET
ii. Spiral Driven Specifications
iii. No Accuracy Standards
iv. Spiral Geospatial procedures, methodologies, minimal toolsets
v. Best-Fit Spiral Scope
vi. Spiral Deployment Dependencies
vii. AODB Oracle 9i Schema

RestOps

i. SIPRNET
ii. ACTD/Spiral Driven Geospatial Specifications
iii. Spiral Accuracy Requirements
iv. Spiral Geospatial procedures, methodologies, minimal toolsets
v. ACTD/LUA Requirements
vi. Spiral Deployment Dependencies
vii. Oracle 9i ROIMS/AODB Schema

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Decision Systems Scope

TBMCS-UL
Theater Battle Management
Unit Level

RestOps
Restoration of Operations

Theater Area of Interest

- **Air Operations**
- **Facilities Status**
- **Limited CIP Awareness**
- **Resource Awareness**

Wing Area of Responsibility

- **Wing Operations/Wing AOI**
- **Airfield Operations and Resources**
- **Facilities, Transportation, Utilities**
- **CIP Awareness High**
- **Situation Awareness High**

Dual Interface – Data Flow

- RestOps
  - Osan ACTD
    - Geospatial accuracies and Robust attribution
    - Flexible display parameters for
      - Sensors, Assets, MDS
      - EAR Data Entry
      - Real Time Situation Awareness; SRC

- TBMCS-UL
  - Base Specific (CAF wide)
    - Location with minimal attribution
    - Vectors of GeoBase CIP suffice
    - JSP Data Entry/Recovery

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System Structure

- Oracle 9i Backbone

Database
Oracle 9i
Cascading Schemas
ULRMDB

- ESRI Shapefile Layers

Geospatial
Shapefiles
Populated Attribution
AODB - ULRMDB

Oracle AODB
ULRMDB Tier Schema
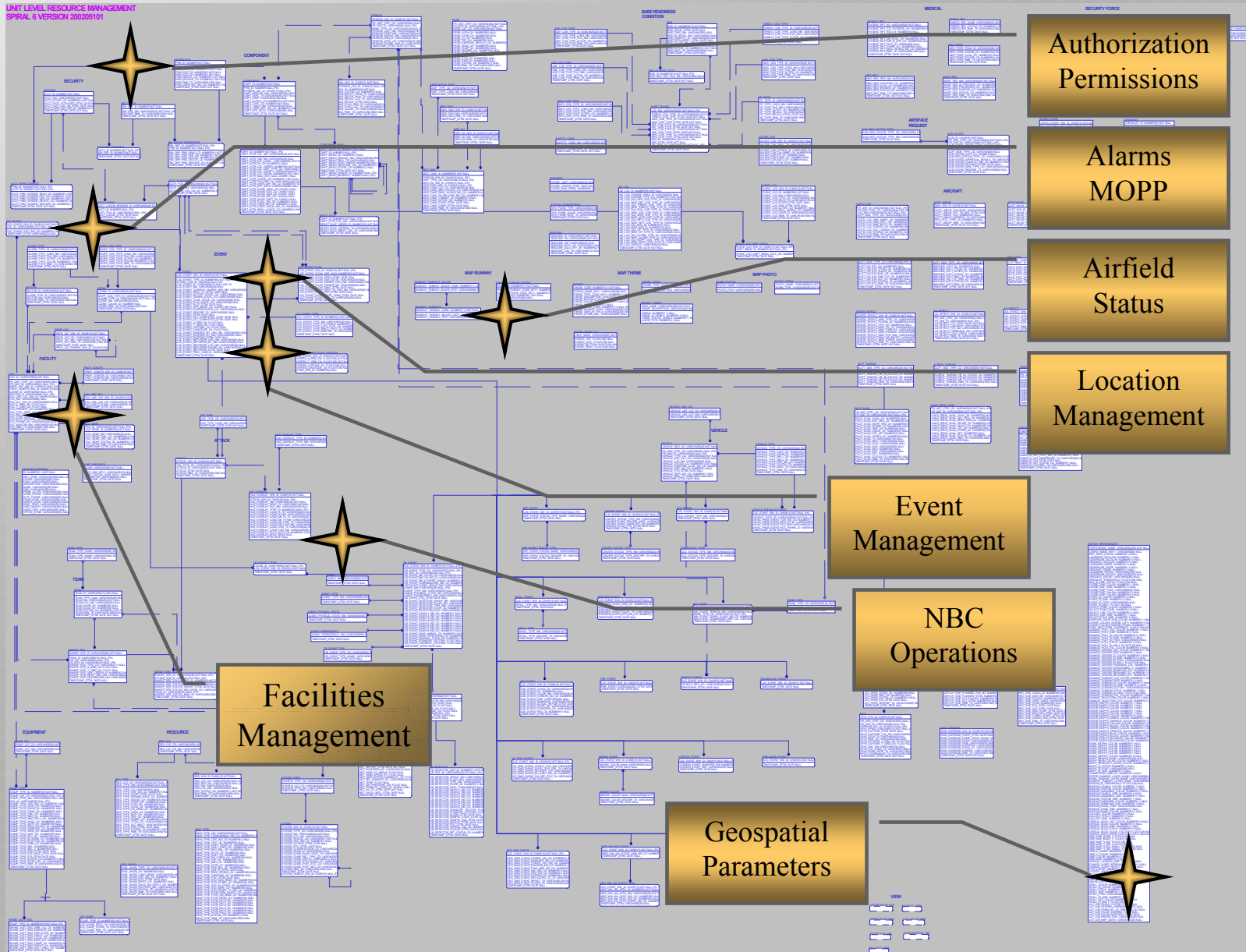
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Authorization Permissions

Alarms MOPP

Airfield Status

Location Management

Event Management

NBC Operations

Facilities Management

Geospatial Parameters

C/JMTK

Joint Service Integration

C/JMTK

- **Thick Clients:** ArcView/ArcObjects extended by ArcSDE, Spatial Analyst and 3D Analyst
- **Thin Clients:** MapObjects Java Standard Edition (or browsers such as IE/Netscape).
- **Application Server:** ArcIMS
- **Data Server:** ArcSDE

Process/Production:

- Military Overlay Editor/Military Analyst – Client and Server
- 'Tracking' Elements - Client and Server

- Extended Toolsets:

Source: C/JMTK, Sue Riley, NIMA, p. 20

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Core Products

ESRI Products

ArcInfo   ArcEditor ArcView

ArcGIS 3D Analyst ArcGIS Spatial Analyst

ArcGIS Geostatistical Analyst ArcSDE

ArcIMS   MOLE ArcPad MOJE

ERDAS Products

IMAGINE JMTK *Bundle Upgrade to IMAGINE Professional*

Imagizer Toolkit Radar-Mapping Suite Orthobase (Windows) Stereo Analyst (Windows)

AGI Products

STK/Professional   STK/Connect

STK/Visualization Option *Standard and Advanced*

STK/Pro/AVO Bundle   HREI-GeoSphere

HREI-Basic FOTE   HREI- Adv FOTE   HREI- Planet Earth

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GeoBase
An Air Force Geospatial Initiative

RestOps Mission Data Set

GeoBase c. Fall 2002
Dimensions

Strategic	Airspace & Ranges, BRAC Support, Homeland Security
Expeditionary	Expeditionary Base Planning, Operations (FOL)
Garrison	Garrison Basing Operations

The GeoBase CIP Concept

– Vision: "One Installation…..One Map

– Mission: "Attain, maintain, and sustain one Geospatial *info-structure* for breakthrough capability"

AODB

RIP

GBDB

GeoBase CIP DB
60 Thematic Layers

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CE	UTIL	SAFETY	COMM	RESTOPS - MDS
AIRFIELD MARKING	FOOTBRIDGE	RECREA. FEATURE		TOPOGR. CONTOUR
AIRFIELD PAVEMENT	FOOTBRr. CENTERLI.	REVETMENT		TOWER
AFLD SAFETY FEAT.	GATE	ROAD		TRAIL
ATHLETIC COURT	GOLF COURSE	MET. SENSOR		TUNNEL
ATHLETIC FIELD	GOLF CRS. BUNKER	MET. STATION		TUNNEL CENTERLI.
BASE BOUNDARY	GOLF CRS. FAIRWAY	MIL TRANING SITE		VEG AREA
BOAT RAMP	LAKE	MISC FEATURE		WATER TOWER
BRIDGE	LEVEE	ROAD CENTERLINE		
BRIDGE CENTERLINE	MISC REC. AREA	SAN. SEWER TR. PL.		
BUILDING	NAVAID	SHED		
CAMP SITE	PARK	SHORELINE		
CAMPGROUND	PARKING AREA	SIDEWALK		
COMM. TOWER	PIER	SLAB		
CURB	PLAYGROUND	SPOT ELEVATION		
DAM	RAILROAD BRIDGE	STREAM		
DRIVEWAY	RR BRDG CENTERLI.	SWIMMING POOL		
FENCE	RAILROAD CENTRLI.			
FIRING RANGE				
FLOOD ZONE				

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GeoBase Operational Environments

- GeoBase (Garrison/Strategic)
    - SDS 2.0+
    - NIPRNET
    - Engineering Accuracy
    - Documented GIS Methods, Procedures, and Toolsets
    - Centralized and Integrated CIP
    - One Installation… One Map
    - SDS Schema/CIP

- GeoBase (Expeditionary)
    - SIPRNET
    - SDS 2.0+ / AAFIF / VPF
    - Variable Accuracy
    - Documented GIS Methodologies, Procedures, and Toolsets
    - Centralized and Integrated FOL deliverable
    - IMS solutions
    - Graded CIP

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Present GeoBase CIP Utilization

- ## Spiral Implementation
  - ### Spiral 7
    - GeoBase CIP Utilization (Base Specific)
      - CAF Wide (ACC, USAFE working...)

- ## Active PACAF GeoBase
  - ### 9 Bases
    - Hickam
    - Eielson
    - Elmendorf
    - Kadena
    - Misawa
    - **Osan**
    - Kunsan
    - Andersen
    - Yokota

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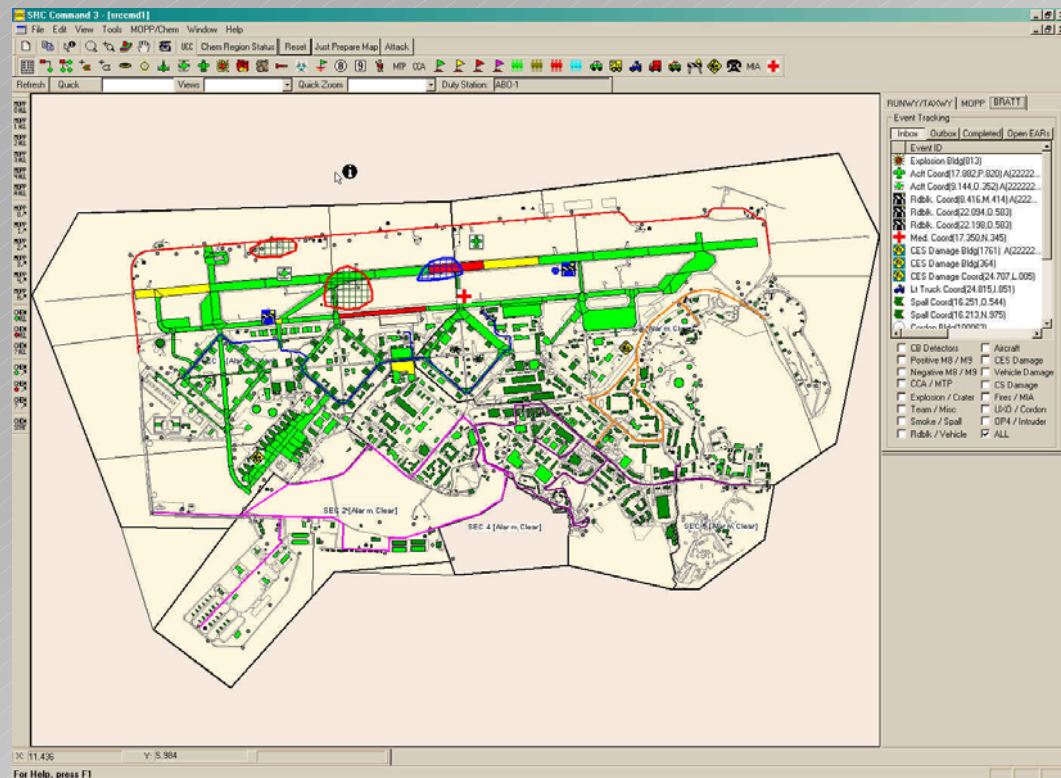
GeoBase Enablement = Integrated Access

- Spiral 7/8 TBMCS-UL Schedules
  - RestOps extended engineering support
    - Titan AES, ITT AES, DTRA, SBCCOM, SAIC, (and Lockheed Martin through TBMCS-FL)
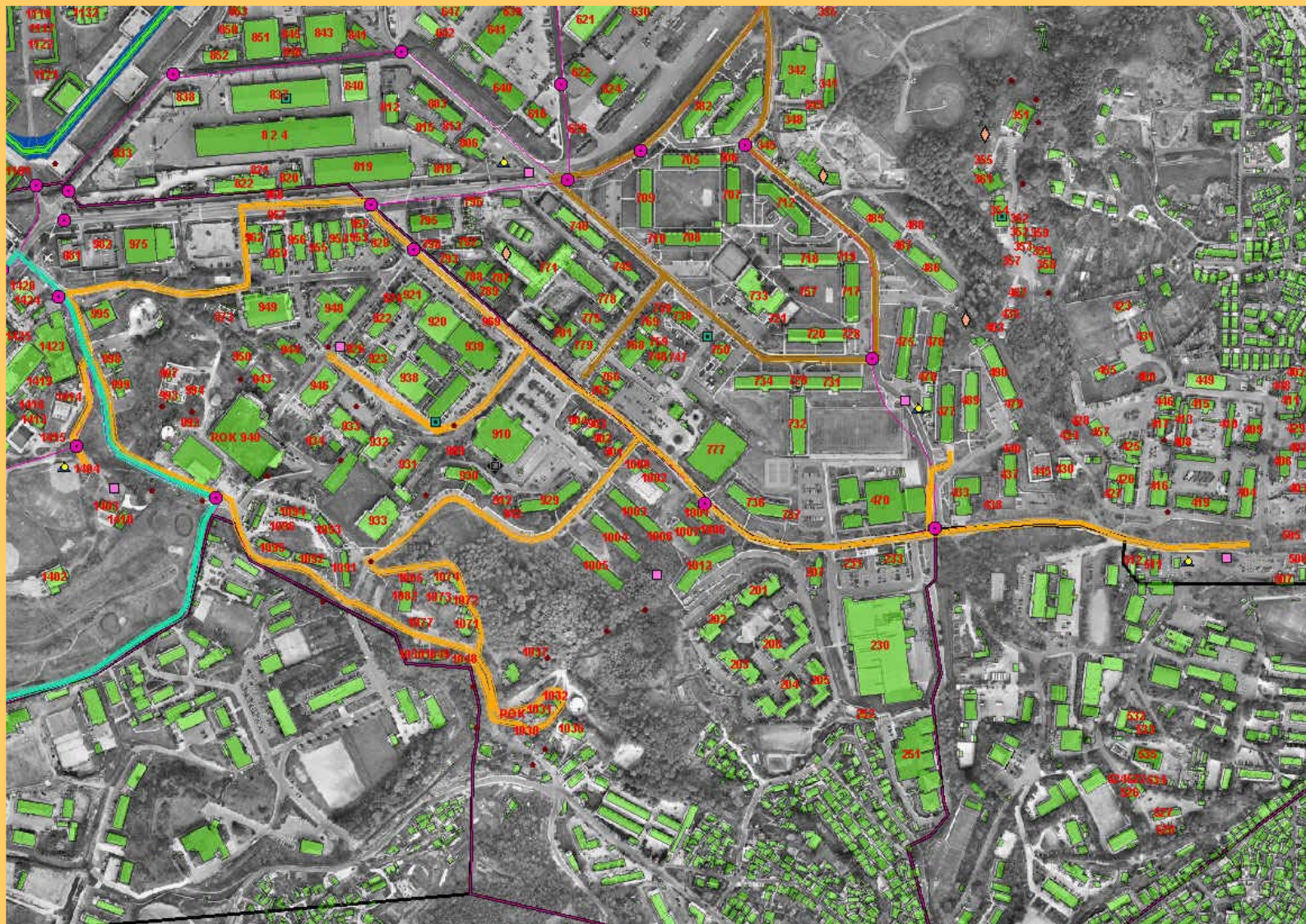
Migrate – Normalize

- Data Integrity and OPEN Utilization Priority
- Primary 'Dynamic' Schema Elements
  - Facilities
  - Events
  - Airfields
  - Scoped SA

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Data Relevancy

RestOps

Operating Picture

– NBC Operational Management

- Integrated sensors, process, response-operations
- Real Time inputs, modeling, messaging
- C2, SA, FP, R/R

Situation Awareness

– Operational response visualization, status, display

– Response and Recovery

– Real Time data; operations, weather, sensors

Event Management

–Event recording, tracking, analyses

–Real Time visualization through Geospatial representation

–Active differentiation through symbology

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'01 – '02 Lessons Learned

Relevance of SCOPE to Geospatial Utility

Importance of Joint Service Process and Development

Importance of Joint Service Solution Integration

Dynamic GeoBase CIP utilization

Relevance of Scoped Situation Awareness

Extended GeoBase CIP Flexibility Requirements

<u>Enable</u> Levels of Standardization (*not always easy*)

Importance of Base Level Communication; data

Normalization, Communication, Scheduling

Co-engineering Requires Proactive Oversight

Legacy Geospatial Functionality Assurance

CASPOD

JSIPP

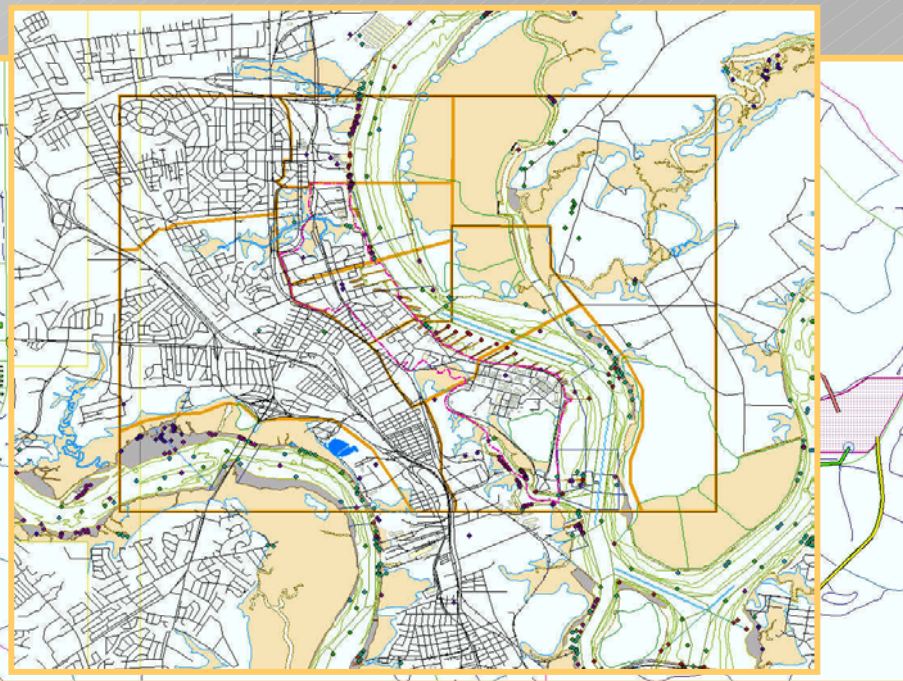2002 – 2003 Geospatial Initiatives

Geospatial Expansion

Directed Development

➤ Scope

➤ Coverage

➤ Interest

➤ Capability

Operations
Force Protection
Nuclear-Bio-Chem
Logistics

Functionality
Tracking
Real Time
Data Integration
Reporting Scopes
SA Multiplicities

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Priority Issues

SIPRNET/NIPRNET

　Safeguarding "One installation...one map" vision?

SRC Geospatial Toolset Technology Migration

　TBMCS-UL Spiral 8 – 9 2003

　C/JMTK and Geospatial Web Enablement

CIP/COP Migration

1. MDS (Mission Data Sets) Host vs. Steward
2. Peripheral - Integrating Programs / Missions
3. Requirements Creep

1. Utility

2. Function

3. Availability

4. Integrated Access

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Future Technical Developments

1-Real Time Geospatial Tracking Analyses
   Mobile Sensors, Fire, Medical, SF

2-NIMA Data & Buffer AOI's
   20km, Base AOR, Mission Specific AOI

3-Geospatial Analyses Tools
   Thematic Layer generation and reporting

4-Imagery Commercial, NIMA, GeoBase
   Orthophotography, NTM, Commercial

5-Integration: Local Jurisdictions
   Federal, State, Municipal
      Geospatial data
         Situation Response
            Jurisdiction operations

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